

DESCRIPTIONS OF NEW GENERA AND SPECIES OF MAM-  
MALS FROM THE PHILIPPINE ISLANDS.

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Early in the year 1903, the Philippine Scientific Association was formed for the purpose of making known the physical resources of the Philippine Islands and gathering materials for the Government Museum of the United States. The author undertook the study of mammals, and on a part of his collection the present paper is based, the greater part having been identified, and the remainder forwarded to Mr. Gerrit S. Miller, jr., Assistant Curator, Division of Mammals, U. S. National Museum, for determination. Mr. Miller is now engaged in studying types of East Indian mammals at the British Museum, where the most difficult forms can be identified by actual comparison with Philippine types. The collection is still so meager that a general report on the mammals, even of the southern islands of the Philippine group, would be premature.

I am indebted to the authorities of the U. S. National Museum for affording me every facility and convenience in working up the collection. My thanks are especially due to Dr. R. Rathbun, Assistant Secretary, Smithsonian Institution, and to Mr. G. S. Miller, jr.; and I received much direct assistance from Mr. Walter L. Hahn, Dr. Marcus W. Lyon, jr., and Dr. Leonhard Stejneger, of the Museum staff, to each of whom I express my sincere and grateful appreciation.

The new genera described are as follows:

*Urogale* (p. 435). Type: *Urogale cylindrura*, new species.

*Podogymnura* (p. 436). Type: *Podogymnura truci*, new species.

*Bullimus* (p. 450). Type: *Bullimus bagobus*, new species.

*Limnomys* (p. 451). Type: *Limnomys sibuanus*, new species.

*Tarsonmys* (p. 453). Type: *Tarsonmys apoensis*, new species.

*Apomys* (p. 455). Type: *Apomys hyllocetes*, new species.

The new species and subspecies described are as follows:

*Cynomolgus mindanensis*, p. 428.

*Cynomolgus mindanensis apoensis*, p. 429.

*Cynomolgus sulcensis*, p. 430.

*Cynomolgus cagayanus*, p. 431.

*Pteropus lanensis*, p. 432.

*Pteropus cagayanus*, p. 433.

*Urogale cylindrica*, p. 435.

*Podogymnura truci*, p. 437.

*Mus tagulayensis*, p. 439.

*Mus albicularis*, p. 440.

*Mus magnirostris*, p. 441.

*Mus mindanensis*, p. 442.

*Mus zambouangae*, p. 443.

*Mus kelleri*, p. 444.

*Mus todayensis*, p. 445.

*Mus ruficani*, p. 446.

*Mus ruficani apicis*, p. 447.

*Mus pantarensis*, p. 448.

*Mus commissarius*, p. 449.

*Bullimus bagobus*, p. 450.

*Limnomys sibuanus*, p. 452.

*Tarsonyis apoensis*, p. 453.

*Apomys hylacetes*, p. 456.

*Apomys petrus*, p. 458.

*Apomys insignis*, p. 459.

### CYNOMOLGUS Reichenbach. (1863.)

#### MACAQUES OR LONG-TAILED GREEN MONKEYS.

Meyer, in his valuable work on the mammals of the Celebes and Philippine archipelagoes, expressed the opinion that when a sufficient number of specimens of these monkeys shall have been assembled from the various islands of the Philippine group characters may be discovered to separate races or species from certain islands or groups of islands. The U. S. National Museum has now acquired 21 specimens from five different islands, and a study of this material has convinced me that the constant differences found in specimens from the islands of Luzon, Mindanao, Sulu, and Cagayan Sulu entitle the forms from these islands to be considered as distinct from each other and from the old species, *Cynomolgus fascicularis* (*Macacus cynomolgus* of authors). A single immature specimen (Cat. No. 125326, U.S.N.M.) from Basilan Island does not show any characters to separate it from the Macaque of the neighboring island of Mindanao. The forms which I recognize are as follows:

#### CYNOMOLGUS PHILIPPINENSIS Isidore Geoffroy.

##### MANILA MACAQUE.

*Chongo* (native Tagalo name).

*Macacus philippinensis* ISIDORE GEOFFROY, Archiv. du Mus., II, p. 568, pl. v; Catal. des Primat., 1851, p. 29 (based on an albino from Manila, Luzon, Philippine Islands).

*Macacus palpebrosus* ISIDORE GEOFFROY, Catal. des Primat., p. 93; Archiv. d. Mus., V, p. 543 (based on normal coloration; specimen also from Manila).—WAGNER, Schreb., S. Suppl., 1855, V, p. 54.

The U. S. National Museum has recently acquired four good specimens of the Luzon Macaque from the province of Batangas, Luzon, Philippine Islands (Nos. 114139 to 114142, U.S.N.M.). The following description is based on these specimens:

*Color.*—Like all the species of this group the pelage of the upperparts and outer surface of limbs is annulated with light and dark. The light rings and glossy texture of the hair give these parts a changing hue when viewed in different lights. The general effect is as follows: Upperparts mummy brown, the hairs everywhere annulated with blackish; top of head strongly tinged with chestnut; sides of head grizzled yellowish olive; forehead ornamented with a brow of stiff black hairs, scarcely separated from the naked orbits by a narrow rim of short, brown hair, which is cut off by intervening black in the center; underparts, including inner surface of limbs, scantily clothed with pale drab-gray hairs of a very silky texture; genitals, broccoli brown; outer surface of limbs, mummy brown, mixed with smoke gray on wrists, ankles, feet, and hands; tail, grayish black above, hair brown below, with a gradual blending of these colors on the sides of the tail.

*Cranial measurements of two adult females from Batangas, Luzon.*

Measurement.	No. 114140, U.S.N.M.	No. 114141, U.S.N.M.
	mm.	mm.
Greatest length (exclusive of incisors) .....	110	110
Basal length .....	83	81
Basilar length .....	79	76
Least palatal length .....	44	42
Palatal breadth (between front molars) .....	18	19
Zygomatic breadth .....	70	66
Mastoid breadth .....	58	55
Greatest breadth of braincase above roots of zygomatica .....	56	55
Least breadth of braincase immediately behind orbits .....	40	40
Orbital breadth .....	57	55
Least distance from orbit to alveolus of inner incisor .....	37	32
Greatest depth of braincase (exclusive of sagittal crest) .....	43	43
Mandible .....	80	78
Greatest depth of ramus .....	16	16
Maxillary toothrow (exclusive of incisors) .....	36	37
Mandibular toothrow (exclusive of incisors) .....	39	40
Crown of middle upper molar .....	7.3 - 7.1	7.6 - 7.1
Crown of middle lower molar .....	7.6 - 6	7.8 - 6.1

*Remarks.*—Measurements taken from skins of monkeys are so unsatisfactory that I have omitted them. Skulls indicate that the size of the Luzon form is about the same as that from Mindanao, but the smaller size of the foramen magnum in all of the Luzon skulls would indicate a more slender animal.

*Specimens examined.*—Four, two adult females and two immature males, all from Batangas, Batangas Province, Luzon, Philippine Islands.

## CYNOMOLGUS MINDANENSIS, new species.

## MINDANAO MACAQUE.

*Chongo* (Visayans of Mindanao).*Ahm'-mo* (Moros of Mindanao).

*Type*.—Adult male (skin and skull). Cat. No. 123450, U.S.N.M. Collected at Pantar (altitude 1,900 feet), Mindanao, Philippine Islands, August 26, 1903, by Edgar A. Mearns. (Original number, 5620.)

*Characters*.—Stouter than *Cynomolgus philippinensis*, and different in color.

*Color*.—Upperparts raw umber, the hairs everywhere annulated with blackish; top of head strongly washed with burnt umber; sides of head pale grayish olive; forehead with grizzled brown front, ornamented with long, stiff, black hairs, forming a bushy brow; underparts pale drab-gray; genitals broccoli brown; outer surface of limbs tawny-olive, becoming drab-gray on the fingers and toes; tail slaty black at base above, becoming paler toward the extremity, and olive-drab below, with a few tawny annuli to the hairs of the upper side near the base. The young are grayer and less brownish.

*Skull and teeth*.—Comparing skulls of adult females, the foramen magnum is larger than in *Cynomolgus philippinensis*; and the lambdoidal crests are more arched and wider, showing less posterior expansion of the braincase. Teeth similar.

*Cranial measurements of six specimens from Pantar, Mindanao.*

Measurement.	No. 123449, U.S.N.M., female.	No. 123455, U.S.N.M., female.	No. 123448, U.S.N.M., male.	No. 123450, U.S.N.M., male, type.	No. 123453, U.S.N.M., male.	No. 123456, U.S.N.M., male.
	mm.	mm.	mm.	mm.	mm.	mm.
Greatest length (exclusive of incisors) .....	105	110	121	125	122	121
Basal length .....	78	82	93	97	92	91
Basilar length .....	72	80	90	94	88	87
Least palatal length .....	42	44	52	56	49	50
Palatal breadth (between front molars) .....	20	20	21	24	21	23
Zygomatic breadth .....	68	70	82	83	79	83
Mastoid breadth .....	53	55	65	64	64	65
Greatest breadth of braincase above roots of zygomatica .....	54	55	59	57	57	59
Least breadth of braincase immediately behind orbits .....	39	40	40	41	40	39
Orbital breadth .....	55	55	65	62	61	65
Least distance from orbit to alveolus of inner incisor .....	35	35	40	45	42	41
Greatest depth of braincase (exclusive of sagittal crest) .....	43	45	47	45	45	46
Mandible .....	78	80	88	91	89	90
Greatest depth of ramus .....	16.5	17	17	17.5	18	18
Maxillary toothrow (exclusive of incisors) .....	34	36	40	38	40	43
Mandibular toothrow (exclusive of incisors) .....	38	41	48	46	45	49
Crown of middle upper molar .....	7.1 × 6.9	7.1 × 7	8-8	7.5 × 7.8	7.5-7	8-8
Crown of middle lower molar .....	7.2 × 5.3	7.5 × 5.9	8.3 × 6.3	7.5 × 6	7.5 × 5.8	8-7

*External measurements of type* (weight 15 pounds avoirdupois).—Total length, 1100; tail vertebrae, 600; tail hairs, 633; hind foot, 137; head, 143; ear above crown, 32; ear above notch at base, 39.

*Remarks.*—The caecum had the human three folds, but lacked an *appendix vermiformis*.

*Specimens examined.*—Eleven skins, 10 with skulls (one skull, Cat. No. 123451, U.S.N.M., missing), 9 from Pantar, Mindanao (Nos. 123448–123456, U.S.N.M.); 1 from the mouth of the Sulug River on the east side of the Gulf of Davao, southern Mindanao (No. 125323, U.S.N.M.); and 1 (No. 125326, U.S.N.M.) from the island of Basilan (off Zamboanga, Mindanao).

CYNOMOLGUS MINDANENSIS APOENSIS, new subspecies.

MOUNT APO LONG-TAILED GREEN MONKEY OR MACAQUE.

*Loo'-toong* (Bagobo natives of Mount Apo).

*Type.*—Adult female (skin and skull), Cat. No. 125321, U.S.N.M. Collected on Mount Apo at the altitude of 6,000 feet, southern Mindanao, Philippine Islands, June 25, 1904, by Edgar A. Mearns. (Original number, 5670.)

*Characters.*—Similar to *Cynomolgus mindanensis*, but paler and different in color.

*Color.*—Upperparts yellowish olive, the hairs everywhere annulated with blackish; top of head slightly washed with burnt umber; sides of head pale olivaceous gray, annulated with darker; forehead pale olivaceous gray, separated from the crown by a strong fringe of stiff black hairs; face gray; underparts whitish smoke gray; genitals bistre; outer surface of limbs pale yellowish olive, changing to olive-gray on lower portion and on hands and feet; upper side of tail slate-black at base, fading to mouse gray on terminal half, and smoke gray on under side. Young, and nearly mature specimens, are colored almost exactly like the two old females.

*Skull and teeth.*—Compared with *C. mindanensis mindanensis* the rostrum is shorter, and the braincase wider, the zygomatic arches more expanded, orbital breadth slightly greater, and the molariform teeth slightly narrower.

*Specimens examined.*—Four skins with skulls, all from Mount Apo at 6,000 feet altitude, June 25 to 29, 1904. Females not pregnant.

*Cranial measurements of adult female from Mount Apo, southern Mindanao.*

Measurement.	No. 125321, U.S.N.M., type.
	<i>mm.</i>
Greatest length (exclusive of incisors).....	107
Basal length.....	80
Basilar length.....	75
Least palatal length.....	39
Palatal breadth (between front molars).....	19.5
Zygomatic breadth.....	72
Mastoid breadth.....	58
Greatest breadth of braincase above roots of zygomata.....	56
Least breadth of braincase immediately behind orbits.....	41
Orbital breadth.....	56.5
Least distance from orbit to alveolus of inner incisor.....	30
Greatest depth of braincase (exclusive of sagittal crest).....	45
Mandible.....	78
Greatest depth of ramus.....	15.5
Maxillary toothrow (exclusive of incisors).....	35
Mandibular toothrow (exclusive of incisors).....	40
Crown of middle upper molar.....	7.1 × 6.4
Crown of middle lower molar.....	7 × 5.8

*External measurements of two adult females from Mount Apo, southern Mindanao.*

Measurement (from fresh specimens).	No. 125321, U.S.N.M., type.	No. 125322, U.S.N.M., topotype.
	<i>mm.</i>	<i>mm.</i>
Total length.....	900	910
Tail vertebrae.....	455	415
Hind foot.....	128	120
Head.....	117	120
Ear above crown.....	31	30
Ear above notch at base.....	35	35

*Measurements of two specimens from Mount Apo, southern Mindanao.*

Measurement (from fresh specimens).	No. 125319, U.S.N.M., immature female tototype.	No. 125320, U.S.N.M., young male topotype.
	<i>mm.</i>	<i>mm.</i>
Total length.....	780	690
Tail vertebrae.....	400	350
Hind foot.....	111	103
Head.....	106	98

**CYNOMOLGUS SULUENSIS, new species.**

## SULU MACAQUE.

*Type*.—Adult male (skull without skin), Cat. No. 125324, U.S.N.M. Collected at the foot of Crater Lake Mountain, on the island of Sulu, Philippine Islands, November 16, 1903, by Edgar A. Mearns. (Original number, 5750.)

*Characters*.—Larger than *Cynomolgus mindanensis* or *C. philippinensis*, with different coloration (from my recollection) and cranial characters.

*Skull and teeth*.—Compared with *C. mindanensis* the skull is larger, with relatively wider frontal and zygomatic arches; rostrum shorter

and broader; audital bullæ more rounded; molariform teeth smaller, without marginal tubercles on inner border.

*Cranial measurements of the type, an adult male, from Sulu.*

Measurement.	No. 125321, U.S.N.M., type.
	<i>mm.</i>
Greatest length (exclusive of incisors).....	126
Basal length.....	96
Basilar length.....	92
Least palatal length.....	51
Palatal breadth (between front molars).....	22
Zygomatic breadth.....	91
Mastoid breadth.....	64
Greatest breadth of braincase above roots of zygomata.....	58
Least breadth of braincase immediately behind orbits.....	41
Orbital breadth.....	73
Least distance from orbit to alveolus of inner incisor.....	44
Greatest depth of braincase (exclusive of sagittal crest).....	49
Mandible.....	93
Greatest depth of ramus.....	20.5
Maxillary tooththrow (exclusive of incisors).....	40
Mandibular tooththrow (exclusive of incisors).....	43
Crown of middle upper molar.....	7.9 × 6.1
Crown of middle lower molar.....	8 × 5.3

*Specimens examined.*—Only the type.

#### CYNOMOLGUS CAGAYANUS, new species.

##### CAGAYAN SULU MACAQUE.

*Type.*—Adult male (skin and skull), Cat. No. 125325, U.S.N.M., collected on Cagayan Sulu Island, Sulu Sea (near Borneo), February 25, 1904, by Edgar A. Mearns. (Original number, 5771.)

*Characters.*—Size, the smallest of the Philippine Macaques; about three-fifths the bulk of *C. philippinensis* or *C. mindanensis*.

*Color.*—The fresh skin was put in alcohol, in which fluid it was shipped to the Museum. From my recollection I should say that its color is now considerably paler than when fresh. At present the upperparts are olive-brown, with scarcely a trace of chestnut or burnt umber on the head; sides of head brownish gray, face smoke gray; forehead grayish in front, behind which a crest of stiff black hair arises; underparts pale drab-gray; outer surface of limbs like the back above, but fading at the knee and elbow joints to drab-gray upon the forearms, hands, legs, and feet; tail above slate-black at base, fading to mouse gray toward the end, and drab-gray on the under side.

*Skull and teeth.*—The skull of the type is similar to that of the male of *C. mindanensis*, but is only as large as the female of that species, the proportion of weight in the sexes being as 9 to 15. The size would be, therefore, only three-fifths of that of *C. mindanensis*. In form the skull quite closely resembles that of *C. suluensis*; but the dentition is relatively much heavier. The audital bullæ are small, but inflated and prominent apically.

*Cranial measurements of the type, an adult male, from Cagayan Sulu Island.*

Measurement.	No. 125325, U.S.N.M., type.
	mm.
Greatest length (exclusive of incisors).....	110
Basal length.....	81
Basilar length.....	77
Least palatal length.....	46
Palatal breadth (between front molars).....	20.5
Zygomatic breadth.....	77
Mastoid breadth.....	60
Greatest breadth of braincase above roots of zygomata.....	55
Least breadth of braincase immediately behind orbits.....	38
Orbital breadth.....	59
Least distance from orbit to alveolus of inner incisor.....	11
Greatest depth of braincase (exclusive of sagittal crest).....	44
Mandible.....	81
Greatest depth of ramus.....	16
Maxillary toothrow (exclusive of incisors).....	39
Mandibular toothrow (exclusive of incisors).....	44.2
Crown of middle upper molar.....	7.9×7
Crown of middle lower molar.....	7.7×5.9
Upper canine from alveolus.....	20
Lower canine from alveolus.....	14

*Specimens examined.*—Only the type.

**PTEROPUS LANENSIS, new species.**

LAKE LANA O FRUIT-EATING BAT.

*Kah-boog'* (Moros of Pantar and Lake Lanao).

*Type.*—Adult male (skin and skull), Cat. No. 123291, U.S.N.M. Collected at Pantar (near Lake Lanao, altitude 1,907 feet), Mindanao, Philippine Islands, September 7, 1903, by Edgar A. Mearns. (Original number, 5626.)

*Characters.*—A member of the subgenus *Pteropus*, and similar to *Pteropus vampyrus* (Linnaeus) except in color. Ears long, and sharply pointed; thumb short compared with that of *P. vampyrus* from Java; and the tibia and forearm are less hairy above.

*Membranes.*—The uropatagium, as in *vampyrus*, is concealed by fur between the knee and body above, but only partially so below; propatagium naked above, furry below; wing membranes naked above, but furred below next to the body and along the border of the forearm.

*Color.*—Wing membranes blackish. Pelage black, above and below, faintly washed with seal brown on upper side of neck, and with burnt umber across shoulders and on rump. A few brownish-gray hairs are intermixed; but these are lacking on the chin, throat, under side of neck, and front of chest, where all of the hairs are black. Viewed in a certain light, the belly shows a tinge of seal brown. The pattern of the russet area of the neck of *vampyrus* is just perceptibly indicated above, but there is no trace of it on the under side of the neck.

*Skull and teeth.*—Similar to those of *P. vampyrus*.

*Specimens examined.*—Only the type.



*Remarks.*—Colonies of these large bats surrounded Lake Lanao, Mindanao, which occupies a basin 2,000 feet above the sea at water level of the lake, whence many of them regularly passed over our camp at Pantar, 5 miles distant, on the Agus River, which drains Lake Lanao. Several were shot and examined at Bacolod, on the northwest shore of the lake; but these specimens were lost in transportation during a military expedition. I do not remember that they varied from the type.

*Cranial measurements of the type, an adult male, from Pantar, Mindanao.*

Measurement.	No. 123291, U.S.N.M., type.
	<i>mm.</i>
Greatest length.....	76
Basal length.....	74
Basilar length.....	72
Median palatal length.....	43
Palatal breadth (between anterior molars).....	12.7
Zygomatic breadth.....	43.5
Least interorbital breadth in front of postorbital processes.....	10.2
Least interorbital breadth behind postorbital processes.....	9
Breadth between tips of postorbital processes.....	34.9
Greatest breadth of braincase above roots of zygomata.....	25.3
Greatest depth of braincase (exclusive of sagittal crest).....	19
Occipital depth.....	15
Greatest depth of rostrum at middle of diastema.....	11.5
Greatest breadth of rostrum at middle of diastema.....	13
Mandible.....	62
Maxillary toothrow (exclusive of incisors).....	29
Mandibular toothrow (exclusive of incisors).....	33
Crown of first upper molar.....	5.6
Crown of first lower molar.....	5

*External measurements of adult male from Pantar, Mindanao.*

Measurement (taken from fresh specimen).	No. 123291, U.S.N.M., type.
	<i>mm.</i>
Head and body.....	350
Alar expanse.....	1385
Distance from tip of nose to end of outstretched hind limb.....	500
Head.....	89
Thumb with its claw.....	69
Thumb without claw.....	55
Longest finger.....	370
Tibia.....	90
Foot.....	65
Calcaneus.....	30
Ear from meatus.....	36
Ear from crown.....	33
Width of ear.....	18

**PTEROPUS CAGAYANUS**, new species.

CAGAYAN SULU FRUIT-EATING BAT.

*Type.*—Adult male (skin and skull), Cat. No. 125289, U.S.N.M. Collected on Cagayan Sulu Island, near the west side of the Sulu Sea, Philippine Islands, February 25, 1904, by Edgar A. Mearns. (Original number, 5755.)

*Characters.*—A member of the subgenus *Spectrum* as defined by Matschie. Similar to *Pteropus hypomelanus* Temminck, but different in color; skull with osseous orbital ring complete in old individuals; teeth smaller than in *P. hypomelanus*.

*Color.*—The skins were temporarily preserved in formalin, but the colors have not been materially changed. Head blackish brown all round but slightly paler on crown, with a few whitish hairs intermixed above; upper side of neck and shoulders wood brown, becoming tinged with tawny posteriorly, where it ends abruptly in a straight transverse line; remainder of upperparts grizzled blackish. Under side of body russet brown, becoming blackish brown on the sides; feet and wing-membranes blackish.

*Skull and teeth.*—Save in the type, which is younger, all of the specimens have the postorbital and jugal processes united, completing the osseous orbit of the eye. Except in this respect, the skull closely resembles that of *P. hypomelanus* from the Natuna Islands, but the latter has the teeth slightly more robust. The same is true of *P. lepidus*. The skull and teeth of *P. cagayanus* are decidedly smaller than in Steere's specimens from Panay, which he called "*Pteropus hypomelanus*."

*Cranial measurements of the type, an adult male, from Cagayan Sulu Island.*

Measurement.	No. 125289, U.S.N.M., type.
	<i>mm.</i>
Greatest length.....	63
Basal length.....	61.5
Basilar length.....	59.5
Median palatal length.....	37
Palatal breadth (between anterior molars).....	11.3
Zygomatic breadth.....	35
Least interorbital breadth in front of postorbital processes.....	8.2
Least interorbital breadth behind postorbital processes.....	6.2
Breadth between tips of postorbital processes.....	26.5
Greatest breadth of braincase above roots of zygomata.....	22.5
Greatest depth of braincase.....	18
Occipital depth.....	13
Greatest depth of rostrum at middle of diastema.....	9
Greatest breadth of rostrum at middle of diastema.....	11.6
Mandible.....	52
Maxillary toothrow (exclusive of incisors).....	24
Mandibular toothrow (exclusive of incisors).....	27.5
Crown of first upper molar.....	5
Crown of first lower molar.....	4.3

*External measurements of well-made skin.*

Measurement.	No. 125289, U.S.N.M., type.
	<i>mm.</i>
Head and body.....	230
Tibia.....	64
Foot.....	45
Calcaneus.....	15
Forearm.....	138
Thumb with claw.....	53
Second (longest) digit.....	250
Ear from meatus.....	21
Ear from crown.....	17.5
Width of ear.....	16

*Specimens examined.*—Three (skins and skulls), all found clinging to midrib of cocoanut-tree leaves, on Cagayan Sulu Island, Philippine Islands, near the west side of the Sulu Sea, February 25, 1904.

UROGALE, new genus.

ROUND-TAILED TUPAIAS.

*Type.*—*Urogale cylindrura*, new species.

*Characters.*—Size large; feet and claws relatively large; tail short-haired and cylindrical. Braincase narrow and elongate; zygomatic vacuities obsolete; rostrum produced, enlarged, and greatly swollen for the accommodation of enormous second incisors; second upper incisor caniniform; third lower incisor minute and erect; lower canines enormous.

UROGALE CYLINDRURA, new species.

MOUNT APO ROUND-TAILED TUPAIA.

*Tahr'-rah Bah'-boo-ey* (Bagobo name, meaning Ground-Pig).

*Type.*—Adult male (skin and skull), Cat. No. 125287, U.S.N.M. Collected on Mount Apo at the Bagobo village of Todaya, altitude 4,000 feet, southern Mindanao, Philippine Islands, July 12, 1904, by Edgar A. Mearns. (Original number, 5727.)

*Characters.*—Those of the genus. Similar to *Urogale everetti* (Thomas), but slightly larger and darker and different in color.

*Color.*—Entire upperparts blackish seal brown, variegated by minute tawny-ochraceous annuli to the hairs; a very indistinct ferruginous stripe over each shoulder; underparts broadly tawny-ochraceous in the median line, this color gradually merging into that of the upperparts; feet clove brown; tail colored like the back above, largely mixed with ferruginous below; naked skin of ears, surrounding eyes, snout, and under surface of feet dusky purplish; iris dark brown.

*Skull and teeth.*—Skull flattened above, and straight, backward to the junction of the parietal ridges, then sharply decurved posteriorly; orbital ring slender posteriorly; occipital crest and ridges very prominent; braincase and postpalatal notch narrow; teeth as in *Urogale everetti* (Thomas).

Cranial measurements of two adult males (type and topotype) from Mindanao, and of the type of *Urogale everetti* (Thomas).

Measurement.	<i>Urogale cylindrura</i> .		<i>Urogale everetti</i> (Thomas), type.
	No. 125287, U. S. N. M., type.	No. 125288, U. S. N. M., topotype.	
	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>
Basilar length.....	56	54	54
Occipito-nasal length.....	63.5	61	64.5
Greatest breadth of skull.....	29.5	29	29
Nasal tip to front edge of orbit.....	31	29	30.7
Interorbital breadth.....	16.4	15.7	17.5
Intertemporal breadth.....	21	20.5	18
Palatal length.....	35	32.5	34
Palatal breadth.....	17	17	16
Palatal breadth, inside.....	9.9	9.5	8.2
Distance from front of first upper incisor to back of third upper molar.....	34	32.5	33.3
Diastema between second upper incisor and canine.....	4.8	4.2	4.4
Diastema between canine and the most anterior premolar.....	1.1	1.2	.9
Second upper incisor, height above bone behind.....	4.8	5	4.8
Second upper incisor, anteroposterior diameter at base.....	2.5	2.5	2.7
Upper canine, height.....	3	3	3
Upper canine, diameter.....	2	1.9	1.7
Third lower incisor, diameter.....	.5	.....	.6
Third lower incisor, height.....	1.4	.....	1.5
Lower canine, height.....	5.4	5.4	5.7
Lower canine, diameter.....	2.6	2.6	2.5
Combined lengths of three upper molars.....	10	9.8	10.6
Combined lengths of three lower molars.....	.....	10.2	10.8

External measurements of two adult males from Mindanao.

Measurement (from fresh specimens).	No. 125287, U. S. N. M., type.	No. 125288, U. S. N. M., topotype.
		<i>mm.</i>
Total length.....	363	360
Tail vertebrae.....	163	155
Tail to end of hairs.....	182	185
Hind foot.....	54	51
Length of head.....	74	68
Height of ear above crown.....	11	9.5
Ear above notch at base.....	21	18
From tip of nose to angle of mouth.....	37	35
From tip of nose to eye.....	40	36
From tip of nose to ear.....	61	58

*Specimens examined*.—The type and one topotype.

*Remarks*.—The only ones seen were two that the Todaya Bagobos brought in to me alive. They called it *Tahr'-rah Bah'-boo-ey*, meaning Ground-Pig. At Tagulaya, on the shore of the Gulf of Davao, the Bagobos called it *Koh-lagh-cher'-ey*, saying that it is common in the mountains, but not found in the low country by the sea.

#### PODOGYMNURA, new genus.

##### LONG-LEGGED WOODSHREWS.

*Type*.—*Podogymnura truci*, new species.

*Characters*.—Related to *Gymnura* and *Hylomys*. Dental formula:  
i.  $\frac{3-3}{3-3}$ , c.  $\frac{1-1}{1-1}$ , pm.  $\frac{3-3}{3-3}$ , m.  $\frac{3-3}{3-3}$ , = 40 teeth; second incisor the

smallest; tail robust and moderately hairy, more than one-third the length of head and body; hind foot seminaked, three-fourths the length of head; whiskers long, reaching shoulders; diameter of eye one-sixteenth the length of head; head less than one-fourth of total length; ears large, seminaked, height from meatus more than one-third the length of head; fore foot seminaked above, entirely so below, with four tubercles, one at the base of the second digit, one at the base of the fifth, a large vase-shaped one at the junction of the third and fourth, and a very prominent one at the base of the palm; hind foot 5-tuberculate, a small one at the base of the first digit, a large one at the base of the second, a vase-shaped one at the junction of the third and fourth, a medium-sized one at the base of the fifth, and a prominent one about midway between the heel and middle digits toward the inner side. Pelage long, full, and soft, with fur of different lengths.

**PODOGYMNURA TRUEI, new species.**

LONG-FOOTED WOODSHREW.

*Tah'-rah Bah'-hoon-ey* (Bagobo).

*Type*.—Adult female (skull, with remainder in alcohol), Cat. No. 125286, U.S.N.M. Collected on Mount Apo at 6,000 feet altitude, southern Mindanao, Philippine Islands, June 25, 1904, by Edgar A. Mearns. (Original number, 5667.)

*Characters*.—Those of the genus.

*Color* (from fresh specimen).—Nose, toes, and claws flesh color; snout, lips, ears, tail, and feet purplish flesh color; pelage of upperparts slate-gray mixed with coarse reddish-brown hairs; underparts hoary, slightly mixed with brown hairs; claws horn color, with a reddish-brown spot at middle.

*Skull and teeth*.—Compared with *Hylomys suillus* Müller and Schlegel, the rostrum is more elongate, and the lower border of maxilla straighter (less arched); narial opening more oblique, sloping backward; nasal bones narrower; ramus of mandible much broader; first upper incisor largest, much smaller than canine; second upper incisor smallest; first upper premolar larger than second or third incisor, unicuspidate, and canine-like; second upper premolar apparently 2-rooted and flattened, with a prominent cingulum; third upper premolar externally similar to second, but with more prominent cingulum, and with the addition of a broad inner step with two tubercles, giving the tooth a quadrilateral form and molariform appearance; first and second upper molars quadrilateral, with four prominent cusps, one at each angle, and a minute central tubercle; third molar smaller, triangular, having three prominent cusps, one at each angle, and an antero-external step. In the mandible the incisors, as in

*Gymnura*, are progressively smaller from before backwards, with laterally expanded cusps, very different from those in the upper jaw; single-rooted lower canines much smaller than upper; lower pre-molars flattened, apparently 2-rooted, cingula prominent; molars decreasing in size from before backward, essentially 4-cuspidate.

This species is named in honor of Dr. Frederick W. True, head curator of the department of biology in the U. S. National Museum.

*Cranial measurements of the type, an adult female, from southern Mindanao.*

Measurement.	No. 125286, U.S.N.M., type.
	<i>mm.</i>
Zygomatic breadth (about) <i>a</i> .....	18
Least interorbital breadth.....	9
Median length of palate.....	21
Length of internasal suture.....	13.6
Greatest length of nasal bone.....	15.1
Greatest breadth of nasals.....	2.5
Height of narial opening.....	4.9
Breadth of narial opening.....	3.5
Breadth of palate between anterior molars.....	5
Greatest breadth of palate outside of teeth.....	10.3
Diastema between first upper incisors.....	2
Distance between outer border of first upper incisors.....	3.3
Between upper canines.....	4.1
Between outer border of upper canines.....	6.1
From anterior border of first upper incisor to posterior margin of last molar.....	20
From anterior border of upper canine to posterior margin of last molar.....	15
From anterior border of first upper incisor to canine.....	5
United lengths of three upper molars.....	6.5
Length of first upper molar.....	2.5
Breadth of first upper molar.....	2.6
Length of first upper incisor from alveolus.....	2.3
Length of first upper canine from alveolus.....	3.1
From anterior border of first lower incisor to posterior border of last lower molar.....	18
Combined lengths of three lower molars.....	7.5
First lower molar.....	3×1.8

*a* Braincase of type and only specimen smashed by trap.

*External measurements of the type, an adult female, from southern Mindanao.*

[Taken from fresh specimen.]

Measurement.	No. 125286, U.S.N.M., type.
	<i>mm.</i>
Total length.....	210
Tail vertebra.....	62
Hind foot.....	36
Fore foot.....	23.5
Head (about).....	49
Ear from crown.....	13
Ear from notch at base.....	19
From tip of nose to eye.....	26.5
From tip of nose to angle of mouth.....	17.5
From tip of nose to ear.....	32
Diameter of eye.....	3
Tibial joint.....	33
Forearm.....	25

## MUS TAGULAYENSIS, new species.

## TAGULAYAN WHITE-TAILED RAT.

*Ahm'-bough* (Visayans of Baganga).

*Umb'-boh Tah-koo'-bung* (Bagobos of Tagulaya).

*Type*.—Adult male (skin and skull), Cat. No. 125264, U.S.N.M. Collected from sea-level, at Tagulaya, on the Gulf of Davao at the foot of Mount Apo, southern Mindanao, Philippine Islands, July 15, 1904, by Edgar A. Mearns. (Original number, 5732.)

*Characters*.—A member of the *Mus xanthurus* group, resembling *Mus everetti* Günther and *M. luzonicus* Thomas, but larger, and otherwise different from either. Tail white on terminal half, nearly naked, with short, stiff hairs between the verticelli; caudal annuli ten to the centimeter; ears nearly naked; pelage of upperparts mixed throughout with spiny hairs.

*Color*.—Upperparts yellowish brown (general effect raw umber), the pelage gray at base except for a mixture of whitish spines, darkest in the vertebral area; sides drab-gray, slightly mixed with raw umber tips to some of the hairs; underparts drab-gray, strongly washed with cinnamon and isabella color on the throat, chest, inner aspect of limbs, and genitals; feet bistre above, with grayish-white tufts at base of nails; claws flesh color tipped with horn color; ears dark drab, fleshy within; tail purplish black all round on basal half, whitish on terminal half.

*Skull and teeth*.—Resembling those of *Mus xanthurus* J. E. Gray.

*Specimens examined*.—Two, the type, and Cat. No. 125266, U.S.N.M., from the Baganga River, southeastern Mindanao, April 30, 1904, collected by the author.

*Cranial measurements of the type, an adult male, from Mindanao.*

Measurement.	No. 125264, U.S.N.M., type.
	<i>mm.</i>
Basilar length (Hensel) .....	44
Occipito-nasal length .....	54
Interparietal breadth (from outer edge of beaded upper margins) .....	17.2
Length of internasal suture .....	21
Greatest breadth of rostrum .....	9.6
Length of upper toothrow .....	10.1

## External measurements, the type.

Measurement (from fresh specimen).	No. 125261, U.S.N.M., type.
	<i>mm.</i>
Total length.....	522
Tail vertebrae.....	260
Tail to end of hairs.....	264
Hind foot.....	52
Head.....	64
Ear above crown.....	23
Ear above notch.....	28
Longest whiskers.....	88

Comparative measurements of three species of the *Mus xanthurus* group.

	Type of <i>Mus ever-</i> <i>etti</i> .	Type (No. 125264) of <i>Mus tagu-</i> <i>layensis</i> .	Type (No. 125258) of <i>Mus albigu-</i> <i>laris</i> .
	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>
Length of head and body.....	216	262	260
Length of tail.....	188	260	236
Length of fore foot.....	25.40	26.40	27
Length of hind foot.....	48.80	52	52
Length of a long hair on back.....	42.32	42	65
Length of skull.....	50.80	54	54
Length of series of upper molars.....	9.17	10.10	10.2
Length of first upper molar.....	4.23	4.20	4.50
Distance between incisors and first molar.....	14.11	14.50	14

## MUS ALBIGULARIS, new species.

## WHITE-THROATED WHITE-TAILED RAT.

*Oom-bough' Kah-wee'-lee* (Bagobos of Todaya on Mount Apo).

*Type*.—Adult male (skin and skull). Cat. No. 125258, U.S.N.M. Collected on Mount Apo at 7,600 feet altitude, southern Mindanao, Philippine Islands, July 3, 1904, by Edgar A. Mearns. (Original number, 5699.)

*Characters*.—Pelage softer, longer, and much denser than that of *Mus xanthurus* J. E. Gray and *M. everetti* Günther, with much fewer spines; terminal two-thirds of tail whitish; size smaller than *M. xanthurus*, with ears relatively smaller. Mammae 4 pairs—2 pectoral and 2 inguinal.

*Color*.—Upperparts yellowish brown (general effect mummy brown), the pelage slate-gray at base except for a mixture of whitish spines, darkest in the vertebral area; sides drab-gray, strongly mixed with raw umber, with which many of the hairs are tipped; underparts white; feet mouse gray, with toes grizzled white, and claws horn color; ears drab-gray, fleshy within. The young are mouse gray above, white below, with more or less brown and russet colors added to the upperparts with increasing age.

*Skull and teeth*.—Closely resembling those of *Mus xanthurus*. The teeth are not quite so simple as those of the *Mus rattus* group, there



being a tendency to the development of extra tubercles or enamel loops on the outer border of both upper and lower molars; but these subsidiary supernumerary cusps lack uniformity, and are frequently wanting; audital bullæ prominent, indented externally.

*Cranial measurements of the type, an adult male, from Mindanao.*

Measurement.	No. 125258, U. S. N. M., type.
Basilar length (Hensel) .....	mm. 45
Occipito-nasal length .....	54
Interparietal breadth (from outer edge of beaded upper margins) .....	16
Length of internasal suture .....	20
Greatest breadth of rostrum .....	9.8
Length of upper molar series .....	10.2

*External measurements of nine specimens from Mount Apo, southern Mindanao.*

Measurement (taken fresh).	No. 125258, U. S. N. M., male type.	No. 125255, U. S. N. M., male topotype.	No. 125260, U. S. N. M., male.	No. 125254, U. S. N. M., female.	No. 125257, U. S. N. M., female.	No. 125259, U. S. N. M., female.	No. 125261, U. S. N. M., female.	No. 125262, U. S. N. M., female.	No. 125263, U. S. N. M., female.
	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Total length .....	496	490	517	480	425	450	481	500	488
Tail vertebra .....	236	242	260	245	210	225	250	255	248
Tail to end of hairs .....	240	247	263	248	213	228	254	258	250
Hind foot .....	52	52	54	49	46	47	49	50	50
Head .....	64	67	65	62	60	63	63	64	64
Ear above crown .....	17	18	20	18	19	19	18	18	19
Ear above notch .....	24	24	25	22	25	26	23	23	25
White portion of tail .....	153	125	.....	125	123	.....	.....	.....	.....

*Remark.*—A female, Cat. No. 125263, U. S. N. M., contained 2 foetuses, July 9, 1904; another, 2 large foetuses, July 3.

*Specimens examined.*—Eighteen, 17 skins with skulls and 1 in alcohol, all from Mount Apo, at 6,750 to 7,900 feet altitude, June 26 to July 9, 1904. Their stomachs were usually filled with fruit, largely mixed with insects.

#### MUS MAGNIROSTRIS, new species.

##### PHILIPPINE GRAY RAT.

*Ahm-bough'* (Moros of Zamboanga).

*Type.*—Adult female (skin and skull), Cat. No. 125212, U. S. N. M. Collected at Zamboanga (old Spanish hospital), western Mindanao, Philippine Islands, January 15, 1904, by Edgar A. Mearns. (Original number, 5639.)

*Characters.*—A member of the *norvegicus* group, resembling *Mus norvegicus* Erxleben in general external appearance, but with a longer

tail, larger ears, and an admixture of grooved spines in the pelage of the upper surface. Eight caudal annuli to the centimeter on middle of tail (two less than in Scandinavian specimens of *Mus norvegicus*); longest whiskers reaching beyond tips of extended ears.

*Color.*—Like that of the gray rat of Norway, but with pelage less dense, and perhaps a trifle paler.

*Skull and teeth.*—Skull heavily ossified; temporal fossa smooth; braincase smooth and flattened above, the region included between the supraorbital beads narrow and triangular as in *Mus norvegicus*; anteorbital region broad and elevated; rostrum greatly thickened; nasals broad, obtusely pointed posteriorly, ending opposite fronto-maxillary suture; audital bullæ flattened and broadened; teeth similar to those of *M. norvegicus*.

*Cranial measurements of the type, an adult female, from Zamboanga, Mindanao.*

Measurement.	No. 125212, U.S.N.M., type.
	<i>mm.</i>
Basilar length (Hensel) .....	39
Occipito-nasal length .....	46
Interparietal breadth (from outer edge of beaded upper margins) .....	13
Length of internasal suture .....	18
Greatest width of rostrum .....	9.3
Length of upper toothrow .....	7.5

*External measurements of the type and of an adult male from Zamboanga, Mindanao.*

[Taken from fresh specimen.]

Measurement.	No. 125212, U.S.N.M., type.	No. 125211, U.S.N.M.
	<i>mm.</i>	<i>mm.</i>
Length .....	404	420
Tail vertebrae .....	195	201
Hind foot .....	42	43
Head .....	53	56.5
Ear above crown .....	18	18
Ear above notch .....	22	21.5
Tail to end of hairs .....	199	.....

*Specimens examined.*—The type and one topotype.

#### MUS MINDANENSIS, new species.

#### MINDANAO SPINY RAT.

*Rec'-ah* (Moros of Pantar).

*Umb'-bough Hah-rec'-lee* (Bagobos of Todaya).

*Type.*—Adult male (skin and skull), Cat. No. 125274, U.S.N.M. Collected at Todaya, altitude 4,000 feet, Mount Apo, southern Mindanao, July 9, 1904, by Edgar A. Mearns. (Original number, 5719.)

*Characters.*—A large member of the *rattus* group. Whiskers reaching to shoulders; tail concolor; upper pelage quite thickly mixed

with flattened, channelled spines; caudal annuli, eight to the centimeter, at middle of tail.

*Color.*—General color of upperparts cinnamon-russet, more grayish brown on the head, everywhere coarsely mixed with black; underparts whitish drab-gray, washed with cinnamon in the pectoral region and along the sides; fore and hind feet whitish drab, usually with a darker area over the middle metatarsals—sometimes as dark as mouse gray. Tail concolor, mouse gray or browner. Young, drab-gray above, whitish smoke gray below.

*Skull and teeth.*—Braincase wide and arched; temporal fossa ridged; audital bullæ high and rounded. Teeth not peculiar.

*Cranial measurements of the type, an adult male, from Todaya, Mindanao.*

Measurement.	No. 125274, U.S.N.M., type.
	<i>mm.</i>
Basilar length (Hensel).....	39
Occipito-nasal length.....	47.5
Interparietal breadth (from outer edge of beaded upper margins).....	16
Length of internasal suture.....	17
Greatest breadth of rostrum.....	9
Length of upper toothrow.....	8

*External measurements of the type, an adult male, from Todaya and of adult female from Pantar, Mindanao.*

Measurement (from fresh specimens).	No. 125274, U.S.N.M., type.	No. 123292, U.S.N.M.
	<i>mm.</i>	<i>mm.</i>
Length.....	420	410
Tail to end of vertebrae.....	215	207
Tail to end of hairs.....	220	211
Hind foot.....	44	40
Head.....	55	53
Ear above crown.....	19	18
Ear above notch.....	23	24

*Specimens examined.*—Ten: three from sea-level, at Davao, Mindanao; five from Pantar, Mindanao (altitude 1,907 feet); and two from Todaya (altitude 4,000 feet), on Mount Apo, Mindanao.

**MUS ZAMBOANGÆ, new species.**

ZAMBOANGA SPINY-HAIRED RAT.

*Type.*—Adult male (skin and skull), Cat. No. 125279, U.S.N.M. Collected at Zamboanga, western Mindanao, Philippine Islands, January 20, 1904, by Edgar A. Mearns. (Original number, 5753.)

*Characters.*—A member of the *rattus-alexandrinus* group. Pelage of upperparts coarse and spiny, of feet and underparts short, fine, and soft, whiskers long, reaching the shoulders; caudal annuli, 11 to the centimeter, on middle of tail; tail concolor, longer than head and body; ears medium-sized, nearly naked except on edges.

*Color*.—Upperparts cinnamon-russet, mixed with gray and black; sides bordered by clear cinnamon; underparts pale drab-gray; feet whitish drab, with a stripe of hair brown on upper surface; tail grayish brown; whiskers black; anterior face of incisor teeth ochraceous.

*Skull and teeth*.—Skull small, narrow, with a short and narrow rostrum, braincase convex above, and with supraorbital bead bending evenly outward posteriorly, without a marked prominence at the outer extremity of the fronto-parietal suture; zygomatic arches very slender; temporal fossa ridged; audital bullæ small, very narrow, and rather high; dentition weak.

*Specimens examined*.—Only the type.

*Cranial measurements of the type, an adult male, from Zamboanga, Mindanao.*

Measurement.	No. 125279, U.S.N.M., type.
	mm.
Basilar length (Hensel).....	32
Occipito-nasal length.....	38.5
Interparietal breadth (from outer edge of beaded upper margins).....	13.6
Length of internasal suture.....	12.5
Greatest width of rostrum.....	7
Length of upper toothrow.....	6.7

*External measurements (from well-made skin).*

Measurement.	No. 125279, U.S.N.M., type.
	mm.
Total length.....	315
Tail vertebrae.....	165
Tail to end of hairs.....	167
Hind foot.....	36
Height of ear above crown.....	15

**MUS KELLERI, new species.**

**DAVAO SOFT-HAIRED RAT.**

*Type*.—Adult female (skin and skull), Cat. No. 125278, U.S.N.M. Collected at Davao, southern Mindanao, Philippine Islands, July 20, 1904, by Edgar A. Mearns. (Original number, 5738.)

*Characters*.—Apparently a member of the *rattus-alexandrinus* group, but without spiny hairs in the pelage; whiskers extending beyond the tips of ears; caudal annuli 10 to the centimeter on middle of tail; tail concolor, longer than head and body; ears large, scantily haired. Mammae 4 pairs: 2 thoracic, 1 abdominal, and 1 inguinal.

*Color*.—Similar to *Mus mindanensis* (see page 442), but darker and more reddish above. Upperparts mars brown, thickly mixed with black; underparts yellowish white; nose sepia; forearm hair brown; feet white with a band of hair brown above, narrow on the hind feet, extending to the base of the toes; tail grayish brown.

*Skull and teeth.*—Skull similar to that of *Mus mindanensis*, but higher in the parietal region, with nasals and rostrum narrower, and with audital bullae smaller and much narrower. Teeth not peculiar.

*Specimens examined.*—Only the type.

This species is named in honor of Mr. Fletcher L. Keller, of Davao, Mindanao.

*Cranial measurements of the type, an adult female, from Davao, Mindanao.*

Measurement.	No. 125278, U.S.N.M., type.
	mm.
Basilar length (Hensel) .....	33.5
Occipito-nasal length.....	41
Interparietal breadth (from outer edge of beaded upper margins).....	13.7
Length of internasal suture.....	14
Greatest breadth of rostrum.....	7
Length of upper toothrow.....	7.5

*External measurements of the type.*

Measurement (taken from fresh specimen).	No. 125278, U.S.N.M., type.
	mm.
Length.....	375
Tail vertebrae.....	198
Tail to end of hairs.....	202
Hind foot.....	40
Head.....	50
Ear above crown.....	18.5
Ear above notch.....	22

### MUS TODAYENSIS, new species.

#### TODAYAN RAT.

*Oomb'-bough Tahr-ree-ahn'* (Bagobos of Todaya, Mount Apo).

*Type.*—Adult female (skin and skull), Cat. No. 125224, U.S.N.M. Collected at Todaya, altitude 4,000 feet, on Mount Apo, southern Mindanao, Philippine Islands, July 11, 1904, by Edgar A. Mearns. (Original number, 5722.)

*Characters.*—Size small; pelage very spiny; ears rather large, nearly naked; tail concolor, finely haired, with annuli (numbering 12 to the centimeter) plainly visible; whiskers extending beyond the tips of the ears; tail about equaling the length of the head and body. Its general appearance suggests the rats of the *Mus surdus* group, which are, however, much more spiny.

*Color.*—Upperparts tawny-olive, finely mixed with black in the vertebral area, and with broccoli brown on the sides; underparts grayish white perceptibly washed with cinnamon; ears and tail purplish gray-brown; feet pale drab-gray, with a stripe of sepia on upper surface.

*Skull and teeth.*—Skull high, with braincase expanded in the parietal and contracted in the frontal region; supraorbital bead prominent; temporal fossa ridged; rostrum stout; nasals narrowed and bluntly pointed posteriorly; audital bullae high and elongate; post-palatal notch wide; anterior surface of upper incisors ochraceous.

*Cranial measurements of the type, an adult female, from Todaya, Mindanao.*

Measurement.	No. 125224, U.S.N.M., type.
	mm.
Basilar length (Hensel).....	27
Occipito-nasal length.....	31
Interparietal breadth (from outer edge of beaded upper margins).....	13
Length of internasal suture.....	13
Greatest breadth of rostrum.....	6
Length of upper toothrow.....	5.9

*External measurements of five adult specimens from Todaya, Mindanao.*

Measurement (taken fresh).	No. 125224, U.S.N.M., type. <sup>a</sup>	No. 125223, U.S.N.M., topotype. <sup>a</sup>	No. 125225, U.S.N.M., topotype. <sup>b</sup>	No. 125226, U.S.N.M., topotype. <sup>b</sup>	No. 125227, U.S.N.M., topotype. <sup>b</sup>
	mm.	mm.	mm.	mm.	mm.
Total length.....	283	278	.....	291	285
Tail vertebra.....	145	141	.....	138	130
Tail to end of hairs.....	148	148	.....	143	133
Hind foot.....	29	27	30	28.5	28
Head.....	42	39	43	42	42
Ear above crown.....	13	13	13	13	13
Ear above notch.....	18	18	18	18	18

<sup>a</sup>Adult female.

<sup>b</sup>Adult male.

*Specimens examined.*—Five adults, all from Todaya, on Mount Apo, altitude 4,000 feet. Skins with skulls.

#### MUS VULCANI, new species.

##### APO VOLCANO RAT.

*Oom'-bough Tabr-rec-ahn'* (Bagobo).

*Type.*—Adult female (skin and skull), Cat. No. 125216, U.S.N.M. Collected on Mount Apo at 7,600 feet altitude, southern Mindanao, Philippine Islands, June 26, 1904, by Edgar A. Mearns. (Original number, 5674.)

*Characters.*—Similar to *Mus concolor* Blyth, but larger; also resembling *M. todayensis*, but smaller, darker, with less spiny hair. Tail not strictly unicolor, but paler on under side; whiskers reaching tip of ears; caudal annuli 10 to the centimeter on middle of tail; ears large, nearly naked; tail about equaling the length of the head and body, but frequently longer.

*Color.*—Central area of upperparts dusky chocolate; sides drab-gray overlaid by tawny-olive tips to the long hairs; muzzle hair brown; underparts whitish gray, perceptibly washed with cinnamon; tail

dusky drab above, drab-gray below; feet whitish drab, without a dusky stripe on upper side; ears drab; whiskers brownish black.

*Skull and teeth.*—Skull light, with prominent superciliary frontoparietal beads; braincase arched above; rostrum depressed; temporal fossa slightly ridged; nasal bones rather narrow, pointed posteriorly; auditory bullae high, narrow, and elongate. Teeth not peculiar.

*Cranial measurements of the type, an adult female, from Mount Apo, Mindanao.*

Measurement.	No. 125216, U.S.N.M., type.
	<i>mm.</i>
Basilar length (Hensel) .....	11.3
Occipito-nasal length .....	30
Interparietal breadth (from outer edge of beaded upper margins) .....	12.5
Length of internasal suture .....	11.5
Greatest width of rostrum .....	6
Length of upper toothrow .....	5.1

*External measurements of the type and of an adult male from Mount Apo, Mindanao.*

Measurement (from fresh specimens).	No. 125219, U.S.N.M.	No. 125216, U.S.N.M., type.
	<i>mm.</i>	<i>mm.</i>
Total length .....	258	225
Tail vertebrae .....	125	135
Tail to end of hairs .....	128	138
Hind foot .....	25.5	27
Head .....	35	36
Ear above crown .....	11	13
Ear above notch at base .....	a 11	18

<sup>a</sup> Ears probably abnormal.

*Specimens examined.*—Eight; 7 skins with skulls, and 1 in alcohol, all from Mount Apo, at 7,600 feet altitude.

#### MUS VULCANI APICIS, new subspecies.

##### APO SUMMIT RAT.

*Type.*—Adult female (skin and skull), Cat. No. 125229, U.S.N.M. Collected on the summit of Mount Apo, altitude about 9,700 feet, southern Mindanao, Philippine Islands, July 6, 1904, by Edgar A. Mearns. (Original number, 5709.)

*Characters.*—Resembling *Mus vulcani vulcani*, but differing in having a much fuller and softer, almost spineless, pelage; ears shorter; whiskers reaching tips of ears; caudal annuli thirteen to the centimeter on middle of tail.

*Color.*—Like *vulcani*, but darker above, and more whitish gray on the underparts, which lack the cinnamon wash.

*Skull and teeth.*—Like those of *vulcani*, but with shorter auditory bullae.

*Cranial measurements of the type, an adult female, from Mount Apo, Mindanao.*

Measurement.	No. 125229, U.S.N.M., type.
	<i>mm.</i>
Basilar length (Hensel) .....	24.9
Occipito-nasal length .....	30.1
Interparietal breadth (measured from the outer edge of beaded upper margins).....	12
Length of internasal suture.....	10.5
Greatest width of rostrum.....	5.3
Length of upper toothrow.....	5.1

*External measurements of the type, an adult female, from Mount Apo, Mindanao.*

Measurement (taken from fresh specimen).	No. 125229, U.S.N.M., type.
	<i>mm.</i>
Total length.....	248
Tail vertebrae.....	120
Tail to end of pencil.....	123
Hind foot.....	26.5
Head.....	36
Ear from crown.....	12
Ear from notch at base.....	17

*Specimens examined.*—Only the type.

**MUS PANTARENSIS, new species.****PANTAR RUSSET MOUSE.**

*Rec'-ah* (Moros of Pantar).

*Type.*—Adult female (skin and skull), Cat. No. 123294, U.S.N.M. Collected at Pantar, altitude 1,907 feet, Mindanao, Philippine Islands, September 4, 1903, by Edgar A. Mearns. (Original number, 5622.)

*Characters.*—Size small; tail concolor, as long as head and body, scantily coated with short, stiff hairs, with annuli numbering thirteen to the centimeter near base of tail; pelage short, thickly mixed with coarse, flattened and channeled spines; moderate-sized ears, nearly naked; whiskers short, not reaching tip of ear.

*Color.*—Upperparts russet, finely mixed with black; underparts grayish cream-buff; ears and tail pale drab; feet grayish white, with a stripe of sepia on upper surface; whiskers brownish black.

*Skull and teeth.*—Skull considerably arched in the parietal region; rostrum short and stout; audital bullae short, broad, and high; temporal fossa ridged; nasal bones truncate posteriorly. Dentition weak, not otherwise peculiar.

*Specimens examined.*—Only the type.



*Cranial measurements of the type, an adult female, from Pantar, Mindanao.*

Measurement.	No. 125294, U. S. N. M., type.
	<i>mm.</i>
Basilar length (Hensel) .....	24.5
Occipito-nasal length .....	29
Interparietal breadth (from outer edge of beaded upper margins) .....	12.6
Length of internasal suture .....	10
Greatest breadth of rostrum .....	5
Length of upper toothrow .....	5.2

*External measurements, the type.*

Measurement (taken from fresh specimen).	No. 125294, U. S. N. M., type.
	<i>mm.</i>
Total length .....	250
Tail vertebrae .....	125
Tail to end of hairs .....	128
Hind foot .....	27
Head .....	36
Ear above crown .....	14
Ear above notch .....	18

**MUS COMMISSARIUS, new species.**

## PHILIPPINE HOUSE-MOUSE.

*Type*.—Adult female (skin and skull), Cat. No. 125213, U.S.N.M. Collected in the military commissary building at Davao, southern Mindanao, Philippine Islands, July 19, 1904, by Edgar A. Mearns. (Original number, 5734.)

*Characters*.—Smaller than *Mus musculus* Linnaeus; color similar, but with underparts darker; whiskers not reaching tips of ears; tail bicolor.

*Color*.—Upperparts hair brown, strongly washed with raw umber; underparts drab, faintly washed with cinnamon; tail dusky brownish above, soiled grayish white below.

*Skull and teeth*.—Similar to *Mus musculus* but smaller, with relatively smaller auditory bullae; nasals ending obtusely, considerably in advance of the base of the premaxillaries, instead of acutely and even with the premaxillaries.

*Specimens examined*.—Two. The type, which contained two fetuses, and male topotype, Cat. No. 125214, U.S.N.M.

*Cranial measurements of the type, an adult female, from Daruo, Mindanao.*

Measurement.	No. 125213, U. S. N. M., type.
	<i>mm.</i>
Basilar length (Hensel).....	15.5
Occipito-nasal length.....	19.5
Greatest parietal breadth.....	8.9
Greatest zygomatic breadth.....	10.2
Length of audital bullae.....	3
Length of internasal suture.....	6.2
Length of upper toothrow.....	3.1

*External measurements of the type.*

Measurement (taken from fresh specimen).	No. 125213, U. S. N. M., type.
	<i>mm.</i>
Total length.....	167
Tail vertebrae.....	83
Tail to end of hairs.....	85
Hind foot.....	17
Head.....	24
Ear above crown.....	11
Ear above notch.....	13.5

## BULLIMUS, new genus.

## BAGOBO RATS.

*Type*.—*Bullimus bagobus*, new species.

*Characters*.—Similar to *Mus*, but with three additional subsidiary cusps to the lower molar series of either side, placed externally, one in front of the last series of cusps of the anterior molar, and one in front of each series of the middle molar; lower jaw with a projecting capsule for the accommodation of the base of the lower incisor tooth; audital bullae collapsed and flattened externally so that the audital opening is compressed and directed posteriorly; skull elevated in the anteorbital region; rostrum elongate; fronto-parietal bead slightly marked, bony palate narrow (see measurements below). Size large; pelage coarse, containing a mixture of ordinarily coarse hair and slender spines on upper surface; whiskers long, reaching the shoulders.

## BULLIMUS BAGOBUS, new species.

## BAGOBO RAT.

*Omb-boi'-say Oom-bough'* (Bagobo).

*Type*.—Adult female (skin and skull), Cat. No. 125248, U.S.N.M. Collected at Todaya, a Bagobo village at 4,000 feet altitude on Mount Apo, southern Mindanao, Philippine Islands, July 13, 1904, by Edgar A. Mearns. (Original number, 5729.)

*Characters.*—Those of the genus. Tail slightly palest below, scantily coated with fine short hairs which nowhere conceal the annuli, which number about nine to the centimeter.

*Color.*—Dorsal area, from forehead to rump, clove brown, many of the hairs tipped or ringed with tawny-olive, and with pelage slate color at base; sides hair brown, thickly mixed with tawny-olive rings and tips to the hairs, the pelage smoke gray at base; underparts yellowish white, with the gray basal portion of hair appearing copiously along the sides; feet sepia brown above, except the toes, which are dirty grayish white; claws flesh color at base tipped with horn color; whiskers black, slightly mixed with grayish-white ones; tail purplish brown above, perceptibly paler and faintly rufescent below.

*Skull and teeth.*—The molars are rooted as follows: Anterior upper molar 5-rooted; middle upper molar 4-rooted; posterior upper molar 2-rooted, the roots exhibiting a tendency to bifurcation.

*Remark.*—The unique specimen was snared by a native, who brought it and a fine specimen of *Mus mindanensis* to me on the trail as I was leaving the Bagobo village of Todaya.

*Cranial measurements of the type, an adult female, from Todaya, Mindanao.*

Measurement.	No. 125248, U.S.N.M., type.
	<i>mm.</i>
Basilar length (Hensel) .....	46
Occipito-nasal length .....	58
Greatest interparietal breadth .....	21.6
Interparietal breadth, measured from outer edge of fronto-parietal ridges .....	16.5
Zygomatic breadth .....	27
Length of internasal suture .....	23.3
Length of audital bulla .....	10
Width of audital bulla .....	7
Length of upper toothrow .....	10
Distance between anterior molars .....	4
Distance between posterior molars .....	4.6

*External measurements of the type (from well-made skin).*

Measurement.	No. 125248, U.S.N.M., type.
	<i>mm.</i>
Head and body .....	275
Scaly portion of tail (end apparently gone) .....	128
Hind foot .....	54
Longest whisker .....	76

LIMNOMYS, new genus.

MARSH-RATS.

*Type.*—*Limnomys sibuanus*, new species.

*Characters.*—Resembles *Mus*. Skull relatively broad and high, with flattened audital bullæ; supraorbital beading slight, becoming obsolete on front of parietals; teeth of type and only specimen too

worn to furnish characters distinguishing them from those of *Mus*, except that the incisors are relatively much narrower. Pelage long and dense, that of underparts resembling *Oryzomys*; tail hairy, especially near the end, where the annuli are concealed; ears moderate in size, coated on edge and outer surface with short hair; feet broad, with underside smooth and naked, with tubercles flattened, the sixth or postero-external one obsolete.

LIMNOMYS SIBUANUS, new species.

SIBUAN RIVER MARSH-RAT.

*Type*.—Adult female (skin and skull), Cat. No. 125228, U.S.N.M. Collected on Mount Apo at 6,600 feet altitude, southern Mindanao, Philippine Islands, June 30, 1904, by Edgar A. Mearns. (Original number, 5688.)

*Characters*.—Those of the genus. Tail concolor, with annuli sixteen to the centimeter at middle, and extreme base smooth and naked below; whiskers long, extending to the shoulders; belly so densely furred that the mammae can not be detected; longest hairs of rump, 35 mm. in length.

*Color*.—General color of upperparts raw umber, washed with tawny-olive on sides, darkest on middle area of upperparts, where the most black hairs are intermixed; entire underparts, except tail, cream-buff, washed with clay color on chest and around vent; tail grayish brown; upper surface of feet broadly banded with seal brown, with toes and sides of feet brownish white; nail-tufts grayish white; claws flesh color tipped with horn color; ears dark drab, with pale yellowish tufts of fur at anterior base; muzzle grayish drab; whiskers mixed black and white; pelage of upperparts gray (No. 6 Ridgway) at base, of underparts cream-buff to the base.

*Remark*.—The unique type was trapped on a wet, mossy growth of vegetation, on the left bank of a little stream which in its lower course becomes the Sibuan River, flowing from Mount Apo. In spite of persistent efforts we failed to procure other specimens.

*Cranial measurements of the type, an adult female, from Mount Apo, Mindanao.*

Measurement.	No. 125228, U.S.N.M., Type.
	<i>mm.</i>
Basilar length (Hensel).....	26
Occipito-nasal length.....	32
Interparietal breadth (between outer edge of upper parietal margins).....	14.5
Length of internasal suture.....	12
Greatest breadth of rostrum.....	5.5
Length of upper toothrow.....	5

*External measurements of the type.*

Measurement (taken from fresh specimen).	No. 125228, U.S.N.M., type.
	mm.
Total length.....	275
Tail vertebrae.....	150
Tail to end of hairs.....	153
Hind foot.....	30
Head.....	40
Ear above crown.....	15
Ear above notch.....	21
Diameter of eye.....	5.8

## TARSOMYS, new genus.

## TUBERCULATE-SOLED RATS.

*Type.*—*Tarsomys apoensis* new species.

*Characters.*—Related to *Mus*, *Apomys*, and *Batomys*. General external appearance similar to *Sigmodon*. Pelage long and rather coarse, but not spiny, with hair of two lengths, the overhair being about twice the length of the ordinary coat. Ear rather prominent, its height from crown nearly one-third the length of head; skin of ear roughened and coated on both surfaces with short, thick hairs. Whiskers long, surpassing the ears. Eyes of medium size. Feet naked below; fore feet 5-tuberculate; hind feet 6-tuberculate, those at base of inner and outer digits 2-lobed, and with several small additional tubercles. Tail hairy. Skull and teeth resembling those of *Batomys* Thomas, but relatively broader, with a more inflated braincase, and large vacuities above the auditory meatus. The lateral teeth are extremely oblique in their position, the upper being rotated outward and the lower correspondingly rotated inward. The anterior upper molar resembles that of *Mus*, differing in that the anterior series comprises but two cusps, a small inner and a large outer one.

## TARSOMYS APOENSIS, new species.

## APO TUBERCULATE-SOLED RAT.

*Type.*—Adult male (skull, with remainder in alcohol), Cat. No. 125280, U.S.N.M. Collected on Mount Apo at 6,750 feet altitude, southern Mindanao, Philippine Islands, July 5, 1904, by Edgar A. Mearns. (Original number, 5706.)

*Characters.*—Pelage coarse, longest on the rump, where the hairs of the general coat measure 20 mm. in length, the stiff black overhairs measuring 40 mm. The shorter hairs are tipped with yellowish brown, slightly grizzled. Palms and soles naked, but with a hairy tuft on inner side at base of heel and a few long hairs at outer border of wrist. The toes are tufted at base of claws, the hairs extending 3 mm.

beyond the tips of the claws. Fore foot 5-tuberculate; three small anterior tubercles forming a triangle, the front one placed at the junction of the third and fourth digits, the others, respectively, at the junction of the second and third and fourth and fifth digits, the outer one being slightly posterior. The two large palmar tubercles are aligned on the abortive thumb, which has a small, round, flattened nail. Hind foot with double-lobed tubercles at the base of the inner and outer digits, small rounded tubercles at the junction of the second and third and third and fourth digits, a small rounded one near the outer margin of the naked sole anteriorly, and an elongated one near the inner margin posteriorly. There are also several additional tubercles of minute size, notably one or two behind the postero-external one. The tail is concolor, quite thickly coated with stiff brownish-black hairs which obscure the annuli, which latter number thirteen to the centimeter on the middle of the tail.

*Color.*—Upperparts brownish slate, enlivened by yellowish-brown tips to the hairs of the general coat; muzzle blackish; underparts grizzled yellowish brown; tail dark purplish brown throughout; feet well coated above with hairs which are drab-brown, slightly grizzled; ears dark purplish brown, coated with blackish hairs; whiskers blackish, with a few grayish white ones; pelage of upperparts slate colored at base, paler at base on underparts.

*Skull and teeth.*—In the general shape of the skull there is a resemblance to *Apomys*, the swollen braincase, lengthened rostrum, and upper profile being similar; but the audital bullæ, anterior palatine foramen, and teeth are very different. In the form of the rostrum and nasals and the length of the anterior palatine foramen, as well as the general configuration, there is a similarity to *Batomys*, which is strengthened by an external resemblance. The teeth are similar to those of *Mus*; but the audital bullæ are more flattened and compressed externally and the palate much broader. The skull is light, with a large semicircular vacuity between the temporal and parietal bones, above the auditory opening. Rostrum elongate; nasals narrow, truncate posteriorly.

*Specimens examined.*—Only the type.

*Cranial measurements of the type, an adult male, from Mount Apo, Mindanao.*

Measurement.	No. 125280, U.S.N.M., type.
	mm.
Basilar length (Hensel).....	28.5
Occipito-nasal length.....	37.5
Greatest interparietal breadth.....	16
Least interorbital breadth.....	6
Length of internasal suture.....	15.2
Breadth of palate between last molars.....	5.1
Antero-posterior diameter of audital bulla.....	6.2
Length of upper tooththrow.....	6.2
Mandible.....	21
Length of mandibular tooththrow.....	6.2

*External measurements, the type.*

Measurement (taken from fresh specimen).	No. 125280, U. S. N. M., type.
Total length.....	mm. 255
Tail vertebrae.....	120
Tail to end of hairs.....	121
Fore foot.....	16 x 5.5
Hind foot.....	32 x 8
Head.....	45
Ear from crown.....	14
Ear above notch at base.....	20
Longest whisker.....	42
Diameter of thickest part of tail.....	5.5

## APOMYS, new genus.

## MOUNT APO MICE.

*Type.*—*Apomys hyllocytes*, new species.

In general, *Apomys* is a connectant of the genera *Mus* and *Peromyscus*. The shape of the pterygoids and postpalatal notch closely resembles those of the genus *Chiropodomys*. The teeth and character of pelage are not unlike those of *Malacomys*, with the exception of the posterior upper molar, which is much smaller and less complex in *Apomys*. The braincase resembles that of *Peromyscus* and *Cricetulus*, but is more swollen in the parietal region.

*Characters.*—General external form as in *Mus*; pollex slightly less rudimentary, with a rather broad nail; soles naked; fore foot with 5 tubercles, 4 of which are placed at the base of the digits, the fifth at the outer side of the base of the palm, the two posterior tubercles being relatively much larger than in *Mus*; hind foot with 6 tubercles, 1 at the base of the first (inner) toe, 1 at the base of the second, 1 at the junction of the third and fourth, 1 at the base of the fifth, a small rounded one on the outer side of the sole a little behind the first digital tubercle, and an elongated one occupying the inner margin of the sole;<sup>a</sup> eyes relatively smaller than in *Mus*; whiskers very long, reaching to the abdomen; body thickly furred above and below, with pelage long and soft; ears large, thin, and naked; tail scantily haired, longer than head and body, sometimes white at the end, the annuli distinctly visible; mammae, two pairs, inguinal. In eight females examined no thoracic or abdominal mammae were detected. Skull elongate, with a pronounced rostral portion; without superciliary bead; incisive foramen less than half the length of diastema between incisor and lateral teeth; upper and lower incisors yellow on anterior face, and without groove; molars rooted; first upper molar 6-tuberculate, in three series,

<sup>a</sup>The tubercles of the hind foot are not paired as they are in *Mus*, but are more widely separated and oblique to each other. In *Mus* the outer tubercle of the middle pair is internal to the base of the outer digit, while in *Apomys* it is marginally placed at the base of the digit.

with three primary and three subsidiary cusps, the anterior series comprising one large anterior tubercle and one small postero-internal tubercle; middle series comprising one large median and two postero-lateral subsidiary tubercles, one large posterior tubercle having an internal ledge. Middle upper molar with two large and three subsidiary tubercles, a large anterior tubercle with a prominent antero-internal and two small lateral tubercles, and a single large posterior tubercle joined to the antero-lateral tubercles by low lateral ridges, the external one obsolete. Third upper molar small, its crown a roughened tubercle with a minute antero-internal groove and tubercle. The two anterior lower molars are quadrituberculate with a posterior step. The posterior lower molar has a notched anterior cusp and rounded posterior tubercle. The anterior lower molar has the anterior cusp but shallowly notched. With age, an anterior step is developed in the first and second lower molars which does not exist in unworn teeth.

APOMYS HYLOCÆTES, new species.

MOUNT APO FOREST-MOUSE.

*Tah-dee'-ahn* (Bagobo).

*Type*.—Adult female (skin and skull), Cat. No. 125246, U.S.N.M. Collected on Mount Apo at 6,000 feet altitude, southern Mindanao, Philippine Islands, July 2, 1904, by Edgar A. Mearns. (Original number, 5696.)

*Characters*.—Those of the genus, of which it is a medium-sized member. Head large and rounded; tail scantily and very finely haired above and below, the rings distinctly visible throughout, the hairs between the verticelli extending to the tip of the tail and measuring about 2 mm. in length; caudal annuli numbering about 16 to the centimeter; tip of tail white for about 20 mm.; soles of feet entirely naked. In this species the tubercles of the hind foot are more crowded and the two innermost much larger than in *Apomys insignis* (described on page 459), the posterior tubercle averaging 6 mm. in length.

*Color*.—The type has the upperparts mummy brown, and the underparts cinnamon-fawn, with a white area in the center of the chest; back, and especially the top of the head finely mixed with black; end of muzzle, and throat, drab-gray; outer surface of fore limbs mouse gray; fore feet whitish; hind feet pale drab-gray above, becoming whitish on the toes, which are tufted at the base of the claws; claws horn color; soles flesh color tinged with drab-gray; tail purplish slate above, pale drab-gray below, white all round at tip; whiskers mixed white and brownish black; naked ears smoke gray; wrists drab-gray below; ankles seal brown; pelage of upperparts blackish slate at base, of underparts (except in the white area) slate-gray. A young male



(Cat. No. 125243, U. S. N. M., from the same locality, June 26, 1904), just emerged from the gray juvenile pelage, has the upperparts sepia brown, much mixed with black, and the underparts smoke gray with a cinnamon-white area in the middle of the chest. The tail to the unaided eye appears naked, but is covered throughout with downy hairs. This, like the remaining specimens of this species, has the tip of the tail white.

*Skull and teeth.*—Braincase inflated; upper profile of skull straight and slightly declining anteriorly, very strongly arched posteriorly; audital bullæ rounded and very high; rostrum slender, elongate; nasals greatly expanded anteriorly, sharply compressed in the middle, thence tapering to a slender point ending, at base, opposite the fronto-maxillary suture.

*Cranial measurements of the type, an adult female, from Mount Apo, Mindanao.*

Measurement.	No. 125246, U. S. N. M., type.
	<i>mm.</i>
Basilar length (Hensel).....	22.3
Occipito-nasal length.....	31
Interparietal breadth.....	14
Interorbital breadth.....	5
Length of internasal suture.....	11.5
Length of upper molar series.....	5.9
Antero-posterior diameter of audital bulla.....	4

*Measurements of five specimens from Mount Apo, Mindanao.*

Measurement (taken fresh).	No. 125246, U. S. N. M., <sup>a</sup> type.	No. 125249, U. S. N. M., <sup>a</sup> 6,750 feet.	No. 125252, U. S. N. M., <sup>a</sup> 6,000 feet.	No. 125250, U. S. N. M., <sup>b</sup> 6,750 feet.	No. 125251, U. S. N. M., <sup>b</sup> 6,000 feet.
	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>	<i>mm.</i>
Total length.....	250	248	265	263	268
Tail to end of vertebra.....	135	131	145	142	150
Tail to end of hairs.....	137	132	147	(c)	151
Hind foot.....	31	30	31	31.5	32
Head.....	35	37	37	38.5	39
Ear above crown.....	15	14.4	15	16	15
Ear above notch.....	20	20	20	20	21

<sup>a</sup>Adult female.

<sup>b</sup>Adult male.

<sup>c</sup>End of tail gone.

*Specimens examined.*—Eight, 2 skins with skulls and 6 (3 males and 3 females) in alcohol, all from Mount Apo, southern Mindanao. Four came from the altitude of 6,000 feet and 4 from 6,750 feet.

*Remarks.*—Paler-colored feet and ears distinguish this species from the largest *Apomys*. The soles of the feet are flesh colored instead of purplish slate. The feet are broader, with larger tubercles, especially as to the two postero-internal ones.

## APOMYS PETRÆUS, new species.

## MOUNT APO ROCK-MOUSE.

*Type*.—Adult female (skin and skull), Cat. No. 125245, U.S.N.M. Collected on Mount Apo at 7,600 feet altitude, southern Mindanao, Philippine Islands, June 30, 1904, by Edgar A. Mearns. (Original number, 5690.)

*Characters*.—Those of the genus, of which it is the smallest known species. Form and pelage like *Peromyscus*. Tail moderately hairy above and below, dark-colored above to the naked tip; caudal annuli about thirteen to the centimeter; hairs of tail about two caudal rings in length on upper surface; soles of feet naked except at the heel.

*Color*.—The type has the upperparts a beautiful russet or mars brown color; underparts pale fawn color, the colors of the upper and under parts blending on the sides; muzzle, throat, and inner aspect of fore limbs smoke gray; outer surface of fore limbs mouse gray; wrists whitish below; feet smoke gray, fading to whitish on toes; claws horn color; tail pale, purplish brown above, flesh color below; whiskers mixed white and brownish black; naked ears drab-gray; iris dark brown; hair of upperparts slate-gray at base, of underparts drab-gray. A second specimen, an adult female topotype (Cat. No. 125244, U.S.N.M.), differs from the type in being considerably darker, principally from a fine admixture of black annuli and tips in the pelage of the upperparts. Prout's brown approaches the general effect nearer than any other shade in Ridgway's Nomenclature of Colors. The color of the underparts lacks the cinnamon tinge of the type, being nearer clay color than fawn or cinnamon, and has a tendency to whiteness in the hinder part of the belly.

*Skull and teeth*.—Braincase swollen in the parietal region; upper profile of skull straight and slightly declining anteriorly, strongly arched posteriorly; audital bulke high and rounded; rostrum moderate; nasals expanded apically, tapering gradually to a pointed base opposite the fronto-maxillary suture.

*Specimens examined*.—Two adult females (skins with skulls), from a rocky talus at the altitude of 7,600 feet, above the forested portion of Mount Apo, taken June 28 and 30, 1904.

*Cranial measurements of the type, an adult female, from Mount Apo, Mindanao.*

Measurement.	No. 125245, U.S.N.M., type.
	<i>mm.</i>
Basilar length (Hensel).....	22
Occipito-nasal length.....	29.5
Interparietal breadth.....	14
Interorbital breadth.....	5.1
Length of internasal suture.....	11.5
Antero-posterior diameter of audital bulla.....	4
Length of upper molar series.....	5.8

*External measurements of two adult females from Mount Apo, Mindanao.*

Measurement (from fresh specimens).	No. 125245, U.S.N.M., type.	No. 125244, U.S.N.M., topotype.
	mm.	mm.
Total length.....	231	236
Tail to end of naked tip.....	120	122
Length of hind foot.....	30	28
Length of head.....	37	35
Ear above crown.....	16	15
Ear above notch.....	20	19

**APOMYS INSIGNIS, new species.**

## GREAT APO MOUSE.

*Tah-ko'-bo Oom-bough'*; *Omb-boi'-say Oom-bough'* (Bagobo).

*Type*.—Adult female (skin and skull), Cat. No. 125230, U.S.N.M. Collected on Mount Apo at 6,000 feet altitude, southern Mindanao, Philippine Islands, July 8, 1904, by Edgar A. Mearns. (Original number, 5711.)

*Characters*.—Those of the genus, of which it is the largest known species; caudal rings about 12 to the centimeter; tubercles of hind feet small and widely separated, the largest measuring less than 5 mm. in length; longest whiskers 60 to 65 mm. in length.

*Color*.—Upperparts mummy brown; underparts cinnamon-fawn, with a white area in the middle of the chest, top of head and back very finely mixed with black; end of muzzle and throat drab-gray; fore leg seal brown externally; fore feet white; hind feet whitish drab above; toes white, tufted at base of claws; naked soles and ear purplish slate; tail purplish slate, paler below, but not distinctly bicolor; three of the fourteen specimens with extreme end of tail white; whiskers mixed white and black; wrists clay color below; ankles seal brown; pelage of upperparts slate color at base, of underparts (except in the white area) slate-gray. Iris dark brown; claws horn color. The white area of the underparts varies from a small stripe between the fore-legs to a broad, irregular ventral band ending near the vent. In one case the white stripe is interrupted.

The young are mouse gray, becoming washed with brown above and cinnamon below as they grow older.

*Skull and teeth*.—Braincase flattened as compared with the other species of *Apomys*; anterior profile of skull flat and level; rostrum thickened; nasals evenly tapering to an acute base even with the fronto-maxillary suture; audital bullæ less inflated and rounded; teeth large.

*Cranial measurements of the type, an adult female, from Mount Apo, Mindanao.*

Measurement.	No. 125230, U.S.N.M., type.
	mm.
Basilar length (Hensel).....	24
Occipito-nasal length.....	32
Interparietal breadth.....	13.5
Interorbital breadth.....	5
Length of internasal suture.....	12
Antero-posterior diameter of auditory bulla.....	4.6
Length of upper toothrow.....	6.1

*External measurements of fourteen specimens of Apomys insignis.<sup>a</sup>*

U.S.N.M. Cat. No.	Original No.	Sex and age.	Length.	Tail verte- bræ.	Tail hairs.	Hind foot.	Head	Ear, crown.	Ear, notch.
			mm.	mm.	mm.	mm.	mm.	mm.	mm.
125230	5711	Female adult.....	287	176	178	35	37	16	20
125231	5726	Female juvenile..	217	123	.....	32.5	.....	.....	.....
125232	5659	Male adult.....	261	154	155	31	38	16.5	20
125233	5660	.....do.....	261	150	151	34	38	16.5	20
125235	5662	.....do.....	275	153	154	35	38	16	22
125236	5663	.....do.....	268	152	153	35	37	16	22
125240	5695	.....do.....	254	142	144	34	36	15	19
125242	5697	.....do.....	284	164	166	36	38	17	21
125234	5661	Male immature....	233	133	.....	34	.....	.....	.....
125237	5664	.....do.....	266	164	.....	34	.....	.....	.....
125238	5665	.....do.....	239	110	.....	34	.....	.....	.....
125239	5666	.....do.....	217	128	.....	31	.....	.....	.....
125241	5683	.....do.....	255	155	157	34	35	17	20
125247	5721	.....do.....	250	144	146	35	35	15	20

<sup>a</sup>Taken from fresh specimens.

*Specimens examined.*—Fourteen, of which two are in alcohol, the remainder skins with skulls. All are from Mount Apo, Mindanao, Philippine Islands, taken June 20 to July 12, 1904, at altitudes of 4,000 (2) and 6,000 (12) feet. Two are females, the remainder males.

*Remark.*—The type, taken on July 8, contained two small fetuses.